OIPE
OCT 20 2003
PATENT & TRADEMARK OFFICE
JC97

Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application. Claim 1 was amended to incorporate the limitations of claim 2. Claim 2 was cancelled. Claims 26-49 are new. Support for the new claims is found at page 4, line 6; page 5, line 1 and the Examples. No new matter has been added.

Listing of Claims:

1. (Currently Amended) A process of treating internal combustion engine exhaust gas containing O_2, NOx, unburnt hydrocarbon ("HC"), CO and soot, comprising:]

i. catalytically oxidizing a substantial part of the HC;

ii. catalytically treating the product of step i to oxidize NO to NO_2;

iii. collecting soot; and

iv. combusting the collected soot by reaction with the NO_2 and possibly any O_2 left over after steps i and ii.

2. (Cancelled)

3. (Previously Presented) Process according to claim 1 carried out over:

i. a first catalyst adapted to be fed with engine exhaust gas and effective to promote oxidation of HC therein;

ii. a second catalyst adapted to be fed with the product of i and effective to promote oxidation of NO to NO_2;

iii. a filter effective to collect soot and to retain it until combusted by said NO_2 and any O_2 left over after catalyst i and ii;

4. (Original) Process according to claim 3 in which the catalysts are honeycomb-supported.

5. (Original) Process according to claim 4 in which the cell density of the honeycomb is in the range 100-900 per square inch.

6. (Previously Presented) Process according to claim 1 in which the gas leaving step/catalyst i undergoes cooling and then enters step/catalyst ii.

7. (Original) Process according to claim 6 in which the first oxidation is carried out close to the source of exhaust gas, whereby to obtain a maximum convenient operating temperature and reaction rate.

8. (Previously Presented) Process according to claim 6 in which the gas leaving step/catalyst i undergoes cooling and then enters step/catalyst ii.

9. (Previously Presented) Process according to claim 6, further comprising providing an increased amount of combustible upstream of a first catalyst for effecting step i for increasing the temperature at which step i operates.

10. (Original) Process according to claim 9 in which said combustible is provided by modifying engine settings to pass more HC and/or generate more CO.

11. (Previously Presented) Process according to claim 6 in which a first catalyst for effecting step i has a very low light-off temperature for HC and CO oxidation.

12. (Previously Presented) Process according to claim 1, wherein the HC is absorbed on the soot.

Cl 13. (Previously Presented) Process according to claim 1, further comprising removing NOx downstream of soot combustion.

14. (Previously Presented) Process according to claim 13 wherein removing NOx uses a regenerable NOx absorber downstream of the collecting trap.

15. (Original) Process according to claim 14 including catalytic NOx-removal downstream of the NOx absorber.

16. (Previously Presented) System for treating internal combustion engine gas containing O_2 NOx, unburnt hydrocarbon ("HC"), CO and soot, comprising:

i. a first catalyst to receive engine exhaust and effective to promote oxidation of HC therein;

ii. a second catalyst receiving the product of the first catalyst and effective to promote oxidation of NO to NO_2; and

iii. a filter effective to collect soot and to retain it until combusted by reaction with said NO_2 and, depending on conditions, any O_2 left over after the first catalyst.

17. (Original) System according to claim 16 in which the catalysts are honeycomb-supported.

18. (Original) System according to claim 17 in which the cell density of the honeycomb is in the range 100-900 per square inch.

19. (Previously Presented) A diesel engine in combination with a system according to claim 16 connected to its exhaust.

20. (Original) An engine according to claim 19 which is one designed for light duty applications.

21. (Original) An engine according to claim 20 which is of the turbo-charged direct injection type.

22. (Original) An engine combination according to claim 19, which is a heavy duty engine.

23. (Original) An engine combination according to claim 22, wherein the first catalyst is positioned close to the second catalyst.

24. (Original) An engine combination according to claim 23, wherein the first catalyst and the second catalyst are at opposite ends of a single catalyst monolith.

25. (Previously Presented) Process according to claim 1 wherein step i further comprises oxidizing some NO to NO_2.

26. (New) A process according to claim 1, wherein the first catalyst comprises at least one supported platinum group metal (PGM).

27. (New) A process according to claim 26, wherein the at least one supported PGM is selected from the group consisting of platinum, palladium and rhodium.

28. (New) A process according to claim 27, wherein the at least one PGM is platinum and palladium.

29. (New) A process according to claim 27, wherein the support is selected from the group consisting of alumina, ceria and alumina and ceria.

30. (New) A process according to claim 28, wherein the support is selected from the group consisting of alumina, ceria and alumina and ceria.

31. (New) A process according to claim 27 comprising a first layer comprising platinum-catalyzed alumina and a second layer comprising ceria overlying the first layer.

32. (New) A process according to claim 27, comprising from 10-150g/ft^3 platinum.

33. (New) A process according to claim 1, wherein the second catalyst comprises at least one supported platinum group metal (PGM).

34. (New) A process according to claim 33, wherein the at least one supported PGM is selected from the group consisting of platinum, palladium and rhodium.

35. (New) A process according to claim 34, wherein the at least one PGM is platinum.

36. (New) A process according to claim 35, wherein the support is alumina.

37. (New) A process according to claim 35, comprising from 10-150g/ft^3 platinum.

38. (New) A system according to claim 16, wherein the first catalyst comprises at least one supported platinum group metal (PGM).

39. (New) A system according to claim 38, wherein the at least one supported PGM is selected from the group consisting of platinum, palladium and rhodium.

40. (New) A system according to claim 39, wherein the at least one PGM is platinum and palladium.

41. (New) A system according to claim 39, wherein the support is selected from the group consisting of alumina, ceria and alumina and ceria.

42. (New) A system according to claim 40, wherein the support is selected from the group consisting of alumina, ceria and alumina and ceria.

43. (New) A system according to claim 39 comprising a first layer comprising platinum-catalyzed alumina and a second layer comprising ceria overlying the first layer.

44. (New) A system according to claim 39, comprising from 10-150g/ft^3 platinum.

45. (New) A system according to claim 16, wherein the second catalyst comprises at least one supported platinum group metal (PGM).

46. (New) A system according to claim 45, wherein the at least one supported PGM is selected from the group consisting of platinum, palladium and rhodium.

47. (New) A system according to claim 46, wherein the at least one PGM is platinum.

48. (New) A system according to claim 47, wherein the support is alumina.

49. (New) A system according to claim 47, comprising from 10-150g/ft^3 platinum.